

REMARKS

Claim Rejections under 35 USC §102

(a) *Southern et al.*

Claims 1-17 and 81-83 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by *Southern et al.* (WO 95/04160). Applicants respectfully traverse the rejection. For example, each of the independent claims 1, 2, 7, 12, 14, 81, 82, and 83 recite the following: “wherein the mixture has a minimum mixture coverage complexity of at least $56/N$ or wherein the set of sub-mixtures has a composite mixture coverage complexity of at least $56/N$, wherein N represents the number of distinct X-mer precursors in the mixture.” The Office Action asserts that this feature is taught at page 5, lines 28-36; Fig. 3a; and page 55, lines 13-23 of *Southern et al.* Applicants respectfully traverse. While certain embodiments of *Southern et al.* may suggest mixtures that have this characteristic, *Southern et al.* do not specifically teach or suggest selecting a mixture that has a composite mixture coverage complexity of at least $56/N$. As the average length of the X-mer precursor increases, the number of distinct X-mers in the mixtures of the independent claims also increases and the mixture coverage complexity may decrease. The Applicants have determined that the lower limit of the mixture coverage complexity is equal to a value of 56 divided by the number of X-mers in the mixture (N). Thus, for at least this reason, all of the features of the independent claims 1, 2, 7, 12, 14, 81, 82, and 83 are not taught or suggested by *Southern et al.*

In addition, as discussed in the instant specification at page 31, line 27 - page 32, line 1, it is important to recognize that the cleavable mass tag approach disclosed by *Southern et al.* utilizes a “ladder tag” design where each discrete oligonucleotide sequence within the mixture is associated with a “spectrum” of mass entities. This stands in contrast with tagged X-mer precursors of the present invention where a mixture of tagged X-mers is designed such that any given oligonucleotide sequence in the mixture is attached to preferably a single mass tag with a discrete molecular weight. Each of the independent claims 1, 2, 7, 12, 14, 81, 82, and 83 has been amended herein to recite the following: “wherein each tag is covalently linked to at least one X-mer precursor through a cleavable linker such that any given oligonucleotide sequence in the mixture is attached to preferably a single tag with a discrete molecular weight.” (Emphasis added). Applicants believe that the foregoing amendment clarifies the distinction of the independent claims over *Southern et al.*

In addition, as noted in the instant specification at page 33, lines 19-26, the X-mer precursors useful in the independent claims may each be represented by a single chemical species as opposed to being represented by a number of variants of similar chemical species, such as the ladder of reporter products used to represent the nucleotide sequence in the oligonucleotide described by *Southern et al.* Thus, each X-mer precursor in the mixtures of the recited independent claims possess a single mass, whereas each oligonucleotide in the mixture of *Southern et al.* is associated with a spectra of masses which represent the nucleotide sequence of interest as discussed above.

Thus, for at least these reasons as well, all of the features of independent claims 1, 2, 7, 12, 14, 81, 82, and 83 are not taught or suggested by *Southern et al.* Applicants therefore respectfully request that the rejection be withdrawn.

Because the independent claims are allowable, then for at least this reason, their respective dependent claims 3-6, 8-11, 13, and 15-17 are also allowable. There may be other reasons as well why the dependent claims are allowable.

(b) *Brenner*

Claims 1, 3-6, and 74-80 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by *Brenner* (U.S. 5,654,413). Applicants respectfully traverse the rejection. Nevertheless, to facilitate prosecution and allowance of the claims, claim 1 has been amended to recite the feature: "a set of tags that are distinguishable by mass spectrometry." (Emphasis added). *Brenner* does not teach or suggest tags that are distinguishable by mass spectrometry. Applicants therefore respectfully request that the rejection of claim 1 be withdrawn.

Because independent claim 1 is allowable, then for at least this reason, its respective dependent claims 3-6 and 74-80 are also allowable. There may be other reasons as well why the dependent claims are allowable.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 1-17 and 74-83 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned agent at (770) 933-9500.

Respectfully submitted,


Cynthia J. Lee, Reg. No. 46,033

**THOMAS, KAYDEN,
HORSTEMEYER & RISLEY, L.L.P.**
Suite 1750
100 Galleria Parkway N.W.
Atlanta, Georgia 30339
(770) 933-9500